



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,201	12/15/2003	Donald L. Yates	M4065.0489/P489-A	4789
24998	7590	06/16/2005	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			TSAI, H JEY	
2101 L Street, NW			ART UNIT	PAPER NUMBER
Washington, DC 20037			2812	

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

5

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/734,201	YATES ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	H.Jey Tsai	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 May 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 22-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/22/04</u> . | 6) <input type="checkbox"/> Other: _____  |

***Election/Restriction***

Applicant's election without traverse of claims 22-33 in the reply filed on May 13, 2005 is acknowledged.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 22-33 are rejected under 35 U.S.C. § 102(e) as being anticipated by Ning 6,709,874.

Ning teaches a magnetic random access memory structure comprising: a plurality of longitudinally extending planarized conductive lines 118/218 formed over an insulating layer 210/110 of a semiconductor substrate 100, col. 4, lines 40-67, col. 5, lines 18-26, col. 6, lines 67 and figs. 1-4,

respective first magnetic layers (bottom part of layer 222) over the conductive lines 18/218, col. 6, lines 49-67,

respective second magnetic layers (upper part of layer 222) over the first magnetic layers, col. 7, lines 4-13,

a planarized conductive material layer 120/220 formed between the planarized conductive lines and said first magnetic layers, col. 5, lines 33-67 and col. lines 41-67,

the conductive material layer 120/220 is selected from the group consisting of tantalum (Ta), titanium (Ti), titanium-tungsten (TiW), and titanium nitride (TiN), col. 5, lines 39-45 and the material layer is a resistive material (heavy refractory metal),

the insulating layer is SiO<sub>2</sub>.

the conductive material layer is formed to a thickness of about 10 nm to about 150 nm,

the conductive lines are formed in a trench formed in the substrate 110/210,

at least one magnetic random access memory (MRAM) cell 222, col. 2, lines 33-67 and figs. 4.

Claims 22, 25, 27-28, 31 and 33 are rejected under 35 U.S.C. § 102(e) as being anticipated by Jones 6,555,858.

Jones teaches a magnetic random access memory structure comprising: a plurality of longitudinally extending planarized conductive lines 228/229a/229b (a digit line) formed over an insulating layer 218 of a semiconductor substrate 200, col. 5, lines 5-30 and figs. 4-6,

respective first magnetic layers 234 (a multilayer stacks) over the conductive lines 232, col. 5, lines 31-67,

respective second magnetic layers 238 or one more layer of multilayer stacks of layer 234 over the first magnetic layers 234, col. 5, lines 31-67,

a planarized conductive material layer 232 formed between the planarized conductive lines and said first magnetic layers, col. 5, lines 18-67,  
the insulating layer is SiO<sub>2</sub>.  
the conductive material layer is formed to a thickness of about 40-60 nm,  
the conductive lines are formed in a trench formed in the substrate, fig. 4,  
at least one magnetic random access memory (MRAM) cell 234, 236, 238, col. 5, lines 30-67 and figs. 6.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 22-33 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 43-67 of copending Application No. 10/196,933. Although the conflicting claims are not identical, they are not patentably distinct from each other because an insulating layer formed between first and second magnetic layers for a MRAM device is obvious. The insulating

Art Unit: 2812

layer serves as a tunneling layer for MRAM device. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 23-24, 26, 29-30 and 32 are rejected under 35 U.S.C 103 as being unpatentable over Jones et al. as applied to claims 22, 25, 27-28, 31 and 33 above, and further in view of Ning 6,709,874.

The difference between the references applied above and the instant claim(s) is: Jones teaches a planarized conductive material formed between first magnetic layer and planarized conductive lines but does not teach the specific range of thickness and the resistive material. However, Nine teaches at col. 5, lines 39-45 the conductive material layer 120/220 is selected from the group consisting of tantalum (Ta), titanium (Ti), titanium-tungsten (TiW), and titanium nitride (TiN), and the material layer is a resistive material (heavy refractory metal), the conductive material layer is formed to a thickness of about 10 nm to about 150 nm.

Art Unit: 2812

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above references' teachings by using a high resistive refractory material and a specific thickness as taught by Ning et al. because resistive material and specific thickness will limit the current flow to form a low current MRAM cell.

Any inquiry of a general nature or clerical matters or relating to the status of this application or proceeding should be directed to the customer service whose telephone number is (703) 308-4357.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. Jey Tsai whose telephone number is (571) 272-1684. The examiner can normally be reached on from 7:00 Am to 4:00 Pm., Monday thru Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt can be reached on (571) 272-1873.

The fax phone number for this Group is (703) 872-9306.

hjt

6/9/2005



H. Jey Tsai

Primary Examiner

Patent Examining Group 2800